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10/054,438	01/22/2002	Gregory D. U'ren	00CON134P-DIV	7270

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FARJAMI & FARJAMI LLP  
16148 SAND CANYON  
IRVINE, CA 92618

EXAMINER

PHAM, LONG

ART UNIT PAPER NUMBER

2814

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/054,438

Applicant(s)

U'REN, GREGORY D.

Examiner

Long Pham

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2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 18-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 26 and 43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 26, "silicon" has no antecedent basis.

Also, the scope and meaning of claim 26 are not understood.

In claim 43, "exposed area" has no antecedent basis. It is unclear where the non-exposed area is located.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 18, 19, 20, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claim 18, AAPA teaches a structure comprising:

a base comprising a single crystal silicon-germanium. see pages 2-5 of the specification of this application; and

a base contact comprising polysilicon. see pages 2-5;

AAPA fails to explicitly teach a collector comprising of single crystal silicon adjacent to the base.

However, the formation of a collector comprising of single crystal silicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

AAPA further fails to explicitly teach an emitter comprising of polysilicon adjacent to the base.

However, the formation of an emitter comprising of polysilicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

Note that the processing limitations recited in structure claim 18 have been given no weight in the determination of patentability of claim 18.

With respect to claims 19-22, the processing limitations recited in structure claims 19-22 have been given no weight in the determination of patentability of claims 19-22.

5. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA.

With respect to claim 23, AAPA fails to teach that base comprises of 8 percent of germanium and 92 percent silicon.

However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal values for the relative concentration of silicon and germanium through routine experimentation and optimization to obtain optimal or desired device performance because the relative concentrations of silicon and germanium are result-effective variables and there is no evidence indicating that they are critical or produce any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

With respect to claim 24, AAPA fails the base contact resistance is 650 ohms per micrometer.

However, However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal values for the base contact resistance through routine experimentation and optimization to obtain optimal or desired device performance because is result-effective variables and there is no evidence indicating that it is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

6. Claims 25, 27, 28, 29, 30, 31, 32, 33, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claims 25, AAPA teaches a structure for forming a heterojunction bipolar transistor comprising:

a single crystal region situated over a first area. see pages 2-5 of the specification of this application; and

a polysilicon region situated over a second area.

With respect to claim 28, AAPA further teaches that the single crystal region comprises of silicon-germanium and the polysilicon region comprises polysilicon silicon-germanium.

With respect to claim 29, AAPA further teaches that the single crystal region or base is in contact in the polysilicon silicon-germanium or base contact.

With respect to claim 30, AAPA further teaches that the single crystal region is a base in a heterojunction bipolar transistor.

With respect to claim 31, AAPA further teaches that the polysilicon region is The processing limitations recited in structure claims 25, 27, and 32-35 have

been given no weight in the determination of patentability of claims 25, 27, and 32-35.

7. Claims 36, 37-40, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA).

With respect to claim 36, AAPA teaches a structure comprising:  
a base comprising a single crystal silicon-germanium. see pages 2-5 of the specification of this application; and  
a base contact comprising polysilicon. see pages 2-5;  
AAPA fails to explicitly teach a collector comprising of single crystal silicon adjacent to the base.

However, the formation of a collector comprising of single crystal silicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

AAPA further fails to explicitly teach an emitter comprising of polysilicon adjacent to the base.

However, the formation of an emitter comprising of polysilicon adjacent to a base in formation of a si-ge based HBT is well-known to one of ordinary skill in the art of making semiconductor devices.

Note that the processing limitations recited in structure claim 36 have been given no weight in the determination of patentability of claim 36.

Note that the processing limitations recited in structure claims 37-40 have been given no weight in the determination of patentability of claims 37-40.

8. Claims 41, 42, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA.

With respect to claim 41, AAPA fails to teach that base comprises of 8 percent of germanium and 92 percent silicon.

However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal values for the

relative concentration of silicon and germanium through routine experimentation and optimization to obtain optimal or desired device performance because the relative concentrations of silicon and germanium are result-effective variables and there is no evidence indicating that they are critical or produce any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

With respect to claim 42, AAPA fails the base contact resistance is 650 ohms per micrometer.

However, However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal values for the base contact resistance through routine experimentation and optimization to obtain optimal or desired device performance because is result-effective variables and there is no evidence indicating that it is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

With respect to claim 45, the use of polysilicon as emitter material is well-known to one of ordinary skill in the art of making semiconductor devices.

### ***Conclusion***

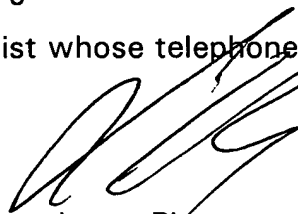
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 703-308-1092. The examiner can normally be reached on M-F, 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is

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assigned are 703-746-4082 for regular communications and 703-746-4082 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

A handwritten signature in black ink, appearing to read 'Long Pham', is written over the printed name.

Long Pham

Primary Examiner

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L. P.

August 29, 2003